

2000 ANNUAL REPORT

CANYON FUEL COMPANY, LLC SUFCO MINE ACT/041/002

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Refer to Record No. 0006 Date 02/4/2001

In C/ 04/002/2001 Incoming

0006



Canyon Fuel Company, LLC
SUFCO Mine
397 South 800 West
Salina, UT 84654
(435) 286-4880 Fax: (435) 286-4499

COPY

February 14, 2001

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~~ACT/041/002~~

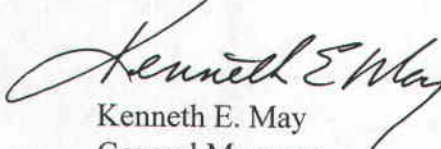
Utah Coal Regulatory Program
1594 West North Temple, Suite 1210
P. O. Box 145801
Salt Lake City, UT 84114-5801

Re: 2000 Annual Report for Canyon Fuel Company LLC, SUFCO Coal Mine
ACT/041/002, Sevier County, Utah

Dear Permit Supervisor:

Enclosed herewith is a copy of the annual report for the Canyon Fuel Company, SUFCO Mine for 2000. The information included is thought to be complete as requested. Questions should be referred to Mike Davis at (435) 286-4421.

Sincerely,
CANYON FUEL COMPANY, LLC
SUFCO Mine


Kenneth E. May
General Manager

Enclosures

KEM/MLD:kb

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FEB 20 2001

DIVISION OF
OIL, GAS AND MINING

To enter text, click in the box and type your response. If a box already contains an entry select the entry and type the replacement. You can use the **tab** key to move from one field to the next. To select a check box, click in the box or type an x.

GENERAL INFORMATION

Permitte Name	Canyon Fuel Company, LLC
Mine Name	SUFCO Mine
Operator Name (If other then permittee)	
Permit Expiration Date	May 20, 2002
Permit Number	ACT/041/002
Authorized Representative Title	Kenneth E. May, Mine Manager
Phone Number	(435) 286-4880
Fax Number	(435) 286-4499
E-mail Address	mdavis@archcoal.com
Mailing Address	397 South 800 West, Salina, UT 84654
Resident Agent	The Corporation Trust Company
Resident Agent Mailing Address	Corporation Trust Center 1209 Orange Street, Wilmington, DE
Number of Binders Submitted	2

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	4200089	Minesite	
	1211UT090008901	Waste Rock Disposal Site	
MSHA Impoundment(s)			
NPDES/UPDES Permit(s)	UT0022918	Minesite Sediment Pond Major Industrial	April 30, 2001
PSD Permit(s) (Air)	DAQE71498	Minesite Air Quality Approval Order	
	BAQE12688	Waste Rock Disposal Air Quality Approval Order	
Other			

CERTIFIED REPORTS

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On File	
Excess Spoil Piles	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certified Reports previously submitted
Refuse Piles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impoundments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Certified Reports previously submitted
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

REPORTING OF OTHER TECHNICAL DATA

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

Technical Data:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On file	
Climatological	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Included on disk in Appendix B
Subsidence Monitoring	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Included in Appendix B
Vegetation Monitoring	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Included in Appendix B
Raptor Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Included in Appendix B
Soils Monitoring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
First quarter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Data previously submitted
Second quarter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Data previously submitted
Third quarter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Data previously submitted
Fourth quarter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Data previously submitted
Geological / Geophysical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Engineering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other Data					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Provide the department of Commerce, annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other changes as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include any certified financial statements, audits or worksheets which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

Legal / Financial Update	Required		Included or on File with DOGM		Comments
	Yes	No	Included	On file	
Department of Commerce, Annual Report of Officers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Included in Appendix C
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

MINE MAPS

Copies of mine maps, current and up-to-date through at least December 31, 2000, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.270. These map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Upon request, the Division shall keep mine maps confidential.

[illegible]

OTHER INFORMATION

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather than by individual mine, please identify each of the mine's data in the list below.

Additional attachment to this report?

Yes ☐

No ☒

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. On the left edge, there is a circular punch hole, suggesting it's part of a notebook or binder. The paper is otherwise blank, with no writing or markings other than the lines themselves.

APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

None - Certified Reports previously submitted.

APPENDIX B

Reporting of Technical Data

Including monitoring data, reports, maps, and other information
As required under the approved plan or as required by the Division

In accordance with the requirement of R645-310-130 and R645-301-140

CONTENTS

Climatological Data on Disk

Subsidence Report

Vegetation Monitoring-Waste Rock Disposal Site

Vegetation Monitoring-Pines Tract

Raptor Survey Report

2000 SUBSIDENCE REPORT

CANYON FUEL COMPANY, LLC

SUFCO MINE

by

JOHN M. BLACK

CHIEF SURVEYOR

INTRODUCTION

Canyon Fuel Company LLC, SUFCO Mine's 2000 subsidence report is an update of annual subsidence data which has been accumulated since 1976 as the former Southern Utah Fuel Company. Prior to 1985, the data was derived from conventional survey methods. Since then, photogrammetric surveys have been employed to monitor the ground movement.

During 1985, the entire SUFCO Mine property was flown to establish a set of baseline photography and a grid of surface elevations. Where possible, an elevation was photogrammetrically determined on an approximate 200 foot grid. These original x, y and z locations serve as a comparative base for determining ground movement in the succeeding years. Other lease holdings that are acquired are flown for similar baseline information. Lease U-63214 was flown in 1991 and the 150 acre modification to lease U-63214 and lease UTU-76195 were flown in 1999.

Once each year around the end of August, another set of aerial photography is obtained. A new elevation is then found at the same x and y coordinates as all the originals within all areas considered to be active. The new, or current, elevations are compared to the originals and the difference between the two is used to generate a contour map. The result is the subsidence contour map included with each annual subsidence report.

The mine subsidence map accompanying this report shows surface control monuments, overburden contours, subsidence contours, surface tension cracks, a current outline of the mine, a one year mining projection and other miscellaneous items as explained in the legend.

SUBSIDENCE HISTORY

SUFCO Mine began operations which cause surface subsidence in June, 1976. Continuous miners were used to extract coal from pillars which were developed as part of a retreating panel. The panels were approximately 650 feet wide and varied in length up to 2,500 feet. The average mining height approached 11 feet and the extraction ratio averaged about 80%.

The resulting subsidence from these continuous miner panels averaged 4 feet in the plateau areas where overburden was 900 feet thick. In areas where panel boundaries were outside the escarpment and beyond the Castlegate Sandstone, subsidence increased with decreasing overburden thickness. The maximum subsidence measured to date, 8.5 feet, occurred in one of these areas. The overburden was only 600 feet thick.

Retreat mining continued in this manner until October, 1985, when a retreating longwall system was added. Longwall panels have ranged from 550 feet to 930 feet wide and up to 18,500 feet in length. Mining heights have varied from 8.5 feet to 12 feet.

Subsidence above the longwall panels has averaged 5 feet in the center of the panels. The overburden thickness has been from 1,800 feet to 1,000 feet (except outside the escarpment where overburden rapidly decreases). The maximum measured subsidence caused by longwall mining is seven feet. This occurred in two cases; 1. An area outside the escarpment very similar to the one mentioned above for the continuous miner panel and 2. In the plateaus with 1,000 feet of overburden.

DORMANT AND ACTIVE AREAS

Dormant areas are those areas that have shown no movement for several consecutive years. Yearly digitizing of these areas will not be done, but photographic coverage can be obtained in the event that a need should arise for reevaluation. These areas may not be shown on the current subsidence map.

Active areas are currently being mined or that have evidence of movement within a reasonable time period. Active areas are digitized and evaluated for subsidence yearly, until they meet the parameters of a dormant area.

2000 SUBSIDENCE

The 1999 subsidence map (Map 1) was updated using data from current photogrammetric monitoring. Each subsidence area is labeled as an independent block. A brief description of each follows:

AREA 1

This was SUFCO Mine's first subsidence area. Undermining began in June, 1976, and continued into 1979. The area is composed of five continuous miner panels which averaged 650 feet in width. Mining height averaged 11 feet with about an 80% extraction ratio.

Maximum subsidence ranged from 4.5 feet to 8.5 feet. It was first detected in 1976 and continued until 1985. No surface movement was detected in this entire area from 1986 to 1989. Area 1 was not digitized for the 1990 subsidence report and is considered dormant.

AREA 2

This is another continuous miner area. The panels here were irregular shaped and the extraction ratio was modest. Undermining ceased in 1984.

Maximum subsidence has been measured at 2 feet. The area has been stable since 1985 and has not been monitored since 1989. This area is dormant.

AREA 3

This area is another continuous miner section, but the extracted area is a portion of mains with protective barriers instead of a panel. Coal recovery was moderate with mined areas which were subcritical. Undermining ceased in 1983.

Maximum subsidence was measured at 2 feet. Because of the limited extraction and subcritical areas, the subsidence occurred slowly with small changes noticeable until 1987. The area appeared stable in 1988 and 1989. It has not been monitored since 1989 and is considered dormant.

AREA 4

This subsidence area is comprised of three continuous miner panels. The mining height averaged 11 feet with a good extraction ratio. Undermining ceased in 1985.

Maximum subsidence was 5 feet with no detectable change in 1989. This area was monitored again in 1993, 1994 and 1995 with no detectable changes. This area was monitored for ten years after undermining ceased. The last detectable subsidence was in 1988. Therefore, this area will be considered dormant.

AREA 5

The four continuous miner panels which make up this area were mined from September, 1978, to November, 1981. Mining height averaged 11 feet with an 80% extraction ratio.

Maximum subsidence was 5 feet with no detectable changes from 1985 through 1991. This area has not been monitored since 1991, and will also remain dormant.

AREA 6

Area 6 is SUFCO Mine's first longwall induced subsidence area. It is comprised of nine longwall panels varying from 540 feet to 700 feet in width and 1,700 feet to 3,900 feet in length. Also, there is a section of recovered mains between two of the longwall blocks. Undermining began in Area 6 during October, 1985, and continued through the mains recovery in March, 1990.

Maximum subsidence measured in areas bounded by the plateau is five feet. There is a location on the map which shows seven feet; but this area is outside the escarpment where the overburden is only 600 feet thick. The subsided escarpment is intentional and is part of a study agreed upon by SUFCO Mine, the Division of Oil, Gas and Mining, the Bureau of Land Management and the U. S. Forest Service. This particular section of escarpment was removed from the "no subsidence zone" to study the effects of longwall mining on the escarpment.

Area 6 has shown no significant changes since 1992. It has been determined that this area is dormant.

AREA 7

Area 7 was originally planned for no subsidence. Pillars were made to support the overburden but began to fail in the north end in 1984 when the underground workings were flooded. The failures progressed towards the south and by 1986, subsidence was detected over the area.

The map shows up to seven feet of subsidence. There was no additional subsidence movement detected from 1988 to 1994. Therefore, this area will also be considered dormant.

AREA 8

Undermining this area began in June, 1983, and was sporadic until 1992. Continuous miners were used with extraction ratios over 80% and average mining heights of 10 feet. This area stayed active longer than most due to its proximity to an adjacent active longwall block.

Maximum subsidence is five feet. No noticeable vertical movement has been detected since 1993. This area is dormant.

AREA 9

This area is a longwall mining area which is composed of four panels. The first began in June, 1989 and the block was finished in January 1992. The mining height averaged about 11 feet and the maximum subsidence shown to date is five feet. There has been no indication of movement since 1996. This area is determined to be dormant.

AREA 10

Area ten is a longwall mining block which began in January 1992 and is presently being mined. The entire surface area above this block was digitized for base-line elevations during 1991. Maximum subsidence shown to date is seven feet. This area will be actively mined for one more year.

The experimental mining practice area discussed under "Area 6" was extended, with regulatory approval, to the east side of the canyon under the Southwest corner of "Area 10". An extensive pre-mining survey of this location was conducted late in 1992. A detailed survey of the post-mining subsidence effects was provided in the 1993 report.

AREA 11

Area eleven is an extension of the last longwall panel in area ten. It extends into a 150 acre modification to lease U-63214. An elevation baseline was established in 1999. Mining under this area began in January 1999 with gateroad development. Longwall mining took place from May 2000 thru September 2000. Subsidence to date shows a maximum of six feet.

AREA 12

Area twelve is the first longwall mining block on the acquired lease UTU-76195. There are three longwall panels in this area. An elevation baseline was established in 1999. Gateroad development began in March 2000. Longwall mining is expected to commence in October 2001.

AREA 13

Area thirteen is the second longwall mining block on the acquired lease UTU-76195. There are four longwall panels in this area. An elevation baseline was established in 1999.

DRAW ANGLE SURVEYS

Several draw angle surveys have been performed during the past years. Completed surveys have been over continuous miner areas and have been oriented both parallel and perpendicular to the long axis of the panel. The average of all measurements is 15°. Individual measurements ranged from 10° to 21°.

New longwall draw angle data was obtained in 1995. Draw angle points were installed in May 1986, on the southern end of the first panel in "Area 6". As shown on the subsidence map, survey lines were placed parallel and perpendicular to the axis of the panel. Undermining of this panel was completed in June 1986. Measurements were taken in 1995 and indicate an angle 15.25° for the perpendicular line. An angle for the parallel line was not obtained because the mains underlying the survey line were partially extracted. These findings coincide with the average of 15° as stated above.

SUBSIDENCE TENSION CRACKS

Tension cracks have occurred above most of the subsidence areas. Most have been located by survey and are shown on the map. Their lengths vary from a few feet to five hundred feet. Most are oriented either parallel to the natural jointing pattern or to the boundaries of the underground excavation. Vertical displacement along the cracks is uncommon and horizontal displacement varies from hairline to several inches in width.

The U. S. Forest Service completed a tension crack study in 1978. They monitored twenty-two different cracks (located in Area 1) with widths varying from 1/8 inch to six inches. Results show that most cracks self-heal, or close, from 13% to 100% of their original width.

DETAILED LONGWALL SUBSIDENCE PROFILE

In 1998 a project was initiated to monitor longwall subsidence in relation to the advancing face. Preparation consisted of first installing two monitoring points outside the subsidence area. Then two base lines were established one 3000 feet long running parallel down the center and the second 1300 feet long perpendicular across the 967 feet wide panel. Markers were installed along these lines on 100 feet spacing using approximately 2.5 feet long rebar with an aluminum cap or a hardened nail drilled into the exposed rock. Initial horizontal and vertical readings were obtained by shooting each marker with a Topcon GTS-3 distance meter from the monitoring points.

Monitoring was done weekly to gather new readings on markers behind and up to 500 feet ahead of the advancing face. The data collected reveals that vertical movement starts approximately 150 feet ahead of the face with 15 hundredth of a foot of subsidence at the face. Then drops off quickly to 4 feet at 600 feet behind the face and gradually levels off at 4 to 5 feet. Horizontal readings indicate the ground initially moves about 30 hundredths of a foot away from the face, then back toward the face 80 hundredths of a foot.

CONCLUSION

Areas 1, 2, 3, 4, 5, 6, 7, 8, 9 are all considered to be dormant. Photographic coverage can be obtained if circumstances deem it necessary. There was active longwall mining in areas 10 and 11 causing subsidence. Longwall mining will stop in area 10 and start in area 12 in the year 2001. Yearly monitoring of Areas 10, 11, and 12 will continue until subsidence has been determined to have ceased on an area by area basis.

JMB:kb

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ENDANGERED PLANT STUDIES, INC.

129 North 1000 East

Orem, Utah 84057

(801-225-7085)

SLSLWELSH@aol.com

28 June 2000

Mr. Michael L. Davis
Southern Utah Fuel Company
P.O. Box 719
Helper, Utah 84526

Dear Mike:

The report on the three lifts of the waste rock site, and the demonstration site is enclosed. The dry year is reflected in the somewhat lower total live cover percentages. All lifts are, nevertheless, improving, and in good condition. I have checked each of the columns of figures several times, and there is minor discrepancy due to rounding in some of them. The differences are slight, however--no refiguring of them will change the basic character of the vegetative cover. If, however, you find anything that needs correcting, please contact me. I will be away from the office until 12 July, on a trip to New Zealand. Hope all is well with you and with the mine.

Sincerely yours,



Stanley L. Welsh
President

Vegetation Monitoring
of the
Waste Rock Disposal

Prepared for:

Southern Utah Fuels Company
P.O. Box 719
Helper, Utah 84526

Attention: Mr. Michael L. Davis
(435) 636-4421

Prepared by:

Stanley L. Welsh and Ronald J. Kass
Endangered Plant Studies, Inc.
129 North, 1000 East
Orem, Utah 84057

28 June 2000

INTRODUCTION

This report describes the 22nd June 2000 sampling and monitoring of Southern Utah Fuels Company (SUFCO) waste rock disposal (WRD) site and Demonstration Plot (DEM). The WRD site was sampled previously during 1992, 1994, 1995, 1996, 1998, and 2000. This year represents the sixth event of monitoring the WRD and the third sampling and monitoring the DEM plot.

The WRD site is composed of three parts; the smooth east side first lift, a pitted second lift, and a pitted third lift, both the second and third lifts are contiguous to the west of the first lift. A third lift has now being reclaimed, has been covered with topsoil and was evidently treated to reseeded in 1999. The DEM plot is located immediately east of the SUFCO main office building at the Convulsion Canyon mine. The currently reclaimed lifts of the WRD represent two different treatments and evidently three different seed mixtures. Each of the lifts have been sampled separately and the results compared. The second, pitted lift was treated and reclaimed in 1994. Comparison data for the three treatment reclamation attempts are included in Tables 1, 2, and 3 respectively. Results of the DEM measurements are included in Table 4. Comparison data for 1992, 1994, 1995, 1996, 1998, 2000 WRD and the 1992 reference site are included in Table 5.

Vegetation was measured during each of the sampling periods at or near the height of the growing season. The dry springtime of 2000 was apparent at the WRD during the 22 June sampling period. Plants were in only moderately good condition. Several of them were in flower, however.

Methods

Sampling techniques complied with Division of Oil Gas and Mining (DOGM) vegetation guidelines (February 1992), and were discussed with Paul Baker (Reclamation Specialist DOGM) in 1992. Sampling was conducted by Drs. Stanley L. Welsh and Ronald J. Kass of Endangered Plant Studies.

Percent cover was estimated by the ocular method for all plots. A 75 m tape was stretched across the longest axis of each treatment type on the WRD and on the DEM. Random numbers were generated and the corresponding numbers were used to locate the 1m² quadrats along the 75 m transect. After sampling a minimum of 15 quadrats, sample adequacy was computed; minimal sample size for the each WRD treatment was N=15. A t-value=1.645 and d-value=0.1 were used as coefficients to calculate sample adequacy.

Results

WRD-First Lift-Smooth

Total mean plant cover was 61.9% (s=8.34). Grasses accounted for 57% comprising 92% of the species composition. Forbs contributed 3.86% comprising 6.2% of the species composition. Shrubs contributed 0.99% of the cover and 1.6% of the species composition (Table 1).

WRD-Second Lift-Pitted

Total mean plant cover was 59.4% (S=10.82). Grasses accounted for 42.9% comprising 72.3% of the species composition. Forbs accounted for 12.07%, representing 20.3% of the species composition, and shrubs contributed 4.3%, or 7.2% of the species composition (Table 2).

WRD-Third Lift-Pitted

Total mean plant cover was 48.5 (s=11.21). Grasses accounted for 26.6% comprising 54.6% of the species composition. Forbs accounted for 21.3%, representing 43.9% of the species composition, and shrubs contributed a scant 0.6% or 1.9% of the species composition (Table 2).

DEM-Demonstration Plot

Total mean plant cover was 56.2% (S=13.05). Grasses accounted for 50.81% of the cover, and represented 90.3% of the species composition. Forbs accounted for 2.3% of the cover and 4% of the species composition. Shrubs accounted for 3.1% of the cover and 5.5% of the species composition (Table 3).

Table 1. Percent cover and species composition of WRD first lift, smooth.

	% cover	% composition
Bare ground	10.67	
Litter	27.4	
<u>Grasses</u>		
Elymus cinereus	11.6	18.7
Elymus lanceolatus	1.67	2.7
Elymus smithii	33.33	53.8
Elymus spicatus	10.47	16.9
Grass totals	57.07	92.1
<u>Forbs</u>		
Aster glaucodes	1.00	1.6
Collinsia parviflora	0.06	T
Machaeranthera canescens	0.33	0.5
Melilotus officinalis	1.67	2.7
Viguiera multiflora	0.80	1.3
Forb totals	3.86	6.1
<u>Shrubs</u>		
Chrysothamnus nauseosus	0.66	1.1
Rosa woodsii	0.33	0.5
Shrub totals	0.99	1.6
Live Cover Total	61.93	99.8

Table 2. Percent cover and species composition for WRD second lift, pitted.

	% cover	% composition
Bare ground	24.6	
Litter	16.0	
<u>Grasses</u>		
Agropyron cristatum	1.33	2.2
Dactylis glomerata	10.00	16.8
Elymus cinereus	6.67	11.2
Elymus lanceolatus	1.47	2.5
Elymus smithii	17.00	28.6
Elymus spicatus	6.47	10.9
Grass totals	42.94	72.3
<u>Forbs</u>		
Achillea millefolium	7.30	12.3
Cirsium undulatum	0.06	T
Cirsium vulgare	0.47	>0.7
Collinsia parviflora	0.20	>0.7
Linum perenne	1.47	2.5
Machaeranthera canescens	0.06	T
Penstemon palmeri	0.27	>0.3
Viguiera multiflora	2.27	3.8
Forb totals	12.1	20.3
<u>Shrubs</u>		
Amelanchier utahensis	0.33	>0.6
Artemisia tridentata	2.33	3.9
Chrysothamnus nauseosus	1.67	2.8
Shrub totals	4.33	7.3
Live Cover Totals	59.40	99.9

Table 3. Percent cover and species composition for WRD third lift, pitted.

	% cover	% composition
Bare ground	41.0	
Litter	10.6	
<u>Grasses</u>		
Agropyron cristatum	0.1	>0.2
Bromus carinatus	11.6	23.9
Elymus lanceolatus	14.0	28.9
Elymus smithii	0.9	1.9
Grass totals	26.6	54.9
<u>Forbs</u>		
Achillea millefolium	1.0	2.1
Linum perenne	0.2	>0.4
Melilotus officinalis	19.4	40.0
Penstemon sp.	0.6	1.2
Verbena bracteata	0.1	>0.2
Forb totals	21.3	43.9
<u>Shrubs</u>		
Artemisia tridentata	0.1	>0.2
Chrysothamnus nauseosus	0.5	1.0
Shrub totals	0.6	1.2
Live Cover Totals	48.5	100

Table 4. Percent cover and species composition for DEM-Demonstration plot.

	% cover	% composition
Bare ground	26.1	
Litter	17.7	
<u>Grasses</u>		
Agropyron cristatum	14.8	26.3
Bromus inermis	1.2	2.1
Elymus cinereus	3.3	5.9
Elymus hispidus	12.3	21.9
Elymus junceus	15.4	27.4
Elymus smithii	1.2	2.1
Elymus spicatus	1.9	3.4
Stipa hymenoides	0.7	1.2
Grass totals	50.8	90.3
<u>Forbs</u>		
Achillea millefolium	0.6	1.0
Linum perenne	1.6	2.8
Tragopogon dubius	0.1	>0.2
Forb totals	2.3	4.0
<u>Shrubs</u>		
Eriogonum corymbosum	3.0	5.3
Symphoricarpus oreophilus	0.1	>0.2
Shrub totals	3.1	5.5
Live Cover Totals	56.2	99.8

Table 5. Percent cover and species richness for 1992, 1994, 1995, and 1992 reference site.

Years Variables	1992 1st li	1994 1st li	1995 2nd li	1995 1st li	1996 2nd li	1996 1st li	1998 2nd li	1998 1st li	Ref. site
Bare ground	35.4	28.6	31.8	16.7	26.7	21.0	20.3	14.5	8.8
Litter	8.3	12.2	8.3	12.3	20.4	32.9	8.7	8.0	24.0
Grasses	45.1	30.3	36.7	68.7	41.9	44.9	51.9	76.5	30.1
Forbs	11.2	27.0	20.9	1.1	8.1	0.8	8.3	0.0	0.2
Shrubs	0.0	2.0	2.3	1.0	2.9	0.4	10.8	0.5	36.8
Totals	56.3	59.4	59.7	71.0	52.9	46.1	71.0	77.1	67.2
Species richness	14	16	20	19	13	6	14	5	7

Table 6. Percent cover and species richness for first, second, and third lifts, 2000.

Years Variables	2000 1st lift	2000 2nd lift	2000 3rd lift
Bare ground	10.7	24.6	41.0
Litter	27.4	16.0	10.6
Grasses	57.7	42.9	26.6
Forbs	3.9	12.1	21.3
Shrubs	1.0	4.3	0.6
Totals	61.9	59.4	48.5
Species richness	13	20	11

Table 7. Percent cover and species richness for DEM plot, 1996–1998.

Variables	1996	1998	2000
Bare ground	15.0	15.4	26.1
Litter	36.0	12.8	17.7
Grasses	39.7	64.3	50.8
Forbs	4.5	3.7	2.3
Shrubs	4.3	3.7	3.1
Percent live cover	49.0	71.6	56.2

Species richness			13
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Discussion

The 22 June 2000 investigation of plant cover and species richness follows an exceptionally dry, but early growing season. The vegetative cover reflects to a large extent the weather regime of the current year. The two different treatments, smooth versus pitted, given to lifts one and two and three respectively continue to respond well in the reclamation attempt. Total live cover for the first lift vegetation continues at a high level, starting at 56.3% in 1992, 59.4% in 1994, 71.0% in 1995, falling to 46.1% in the drought year of 1996, and rising to 77.1% during the wet spring of 1998. Despite the dry spring of 2000 the percent live cover stood at 61.9 percent. The trend over the six measurements is upward, averaging at or near that of the reference site's 67.2%.

Total live cover for the second lift was 59.7% when first measured in 1995, dropped to 52.9% during the drought year of 1996, and responded at 71.0% during 1998. In the current year total live cover is 59.4 percent. This lift too averages near the reference site total live cover.

The east portion, i.e., Lift 1, was graded to a smooth surface prior to planting before 1992—that of Lifts 2 and 3, were treated to a basin-lifting technique that resulted in a dimpled surface. Effects of the 1996 drought were especially apparent on the smooth surface of Lift 1, but recovery during the wet year of 1998 is readily apparent, and continued to gain or remain stable in the 2000 investigation. Both kinds of treatment, which apparently received different seed mixtures on all three lifts, have responded well in spite of the drought interludes of 1996 and 2000. Shrubs are doing better on the dimpled second lift than on the smooth first lift treatment, while grasses provide more of the live cover on the smooth treatment. Only the first lift treatment had lower species richness than for the reference site in 1998, but exceeds the reference site in richness in 2000.

A possible solution to increasing shrubs in the long term, as emphasized in the 1995 and 1996 reports, might involve harvesting of mature inflorescences of big sagebrush and perhaps rabbitbrush from below the reference site and broadcasting them on both lifts one and two. That should provide an abundant seed source on site. Substantial germination of sagebrush seeds might increase the potential for shrub intermix among the other grass and forb vegetation. Lack of forbs on the first lift quadrats is a result of sampling in large part, but represents the continued decline in forbs following their initial success. Such a decline is predictable.

The third lift, dimpled as was the second, evidently was reclaimed with a different seed mix than was utilized on either lifts one or two. Yellow sweet clover formed a large percentage of the total live cover on that lift. It is recovering nicely, however.

The demonstration site, on a steep slope (58%) immediately east of the loadout area in Convulsion Canyon, was measured this year for the third time. Despite the steepness of the slope and the use of very raw substrate, the success of the revegetation attempt is readily apparent. Total live cover percentage was measured at 49.0 in 1996, 71.6 during the wetter than normal year 1998, and 67.2 this year. Reclamation of this slope proceeds well. There is still evidence of creep of the soil mantle at the upper edge of the slope, but general stability of the remainder continues to be encouraging. Establishment of the native buckwheat, *Eriogonum corymbosum*, is likewise encouraging. This plant is evident as a dominant on the adjoining, untreated, slope. It is a common component of vegetation along the coal measures in Utah.

PINES TRACT VEGETATION STUDY

For
CANYON FUEL COMPANY, LLC
SUFCO MINE

Prepared by
Keith W. Zobell
8684 South 400 West
Spanish Fork, Utah 84660
Phone (801) 798-8926

July 20, 2000

PINES TRACT VEGETATION STUDY

Prepared by
Keith W. ZoBell
July 20, 2000

Originally the vegetation study for the Pines Tract area was concentrated on the "Link Canyon Trail Columbine" (*Aquilegia flavescens* var. *rubicunda*). Six photo points were established in July 1999. These photos plots were to be revisited annually until subsidence was complete to determine if coal mining had any affect on these plant communities..

The DOGM approval document for Pines Tract has required the vegetation study be expanded to include some riparian and hanging fern garden areas.

On July 18, 2000 the Pines Tract area was visited by Keith ZoBell (Environmental Specialist), Chris Hansen (Environmental Coordinator for Canyon Fuel Company, LLC) and Mike Davis (Mining Engineer for Canyon Fuel Company, LLC,- SUFCO Mine). The purpose of this trip was to revisit the original six photo points, to take new photos of these sites, and to establish new photo points in riparian and hanging fern gardens areas.

The weather records show that the Pines Tract area had received below average precipitation during the winter of 1999-2000. This low moisture has exhibited itself in reduced flows in the seeps, springs, and streams in the area, as well as a reduction in the vigor and growth of the vegetation of the general area. The Pines Tract grazing unit was the first unit to be grazed by cattle in 2000. The majority of the cattle had been removed from the grazing unit in early July.

The attached photos (Photo points # 1a, 1b, 1c, 2, 3, 4, 5w, 5t, & 7) show the photo points established in 1999. It is apparent from these photos there has been an impact to the monitored vegetation by both the lack of moisture and by grazing cattle. A good example of this is shown at photo point No's 5 & 7 where there is a lack of flowering stems on the Link Canyon Columbine plants. The plants are still established at the photo points but grazing this year has removed the flowering stocks.

A new riparian photo point (Photo points No. 6w, and 6t, as shown on the attached photos) was established in the bottom of Box Canyon. This photo point is located approximately 100 yards upstream of SUFCO water monitoring station 090 and is adjacent to vegetation survey stake R-13. The vegetation at this site is composed primarily of Sedges (*Carex spp.*), Kentucky Blue Grass (*Poa pratensis*) scattered willows (*Salix spp.*) and some wire grass (*Juncus spp.*) and Potentilla (*Potentilla spp.*)

Two new photo points were established in the "Grotto Area", (SUFCO water monitoring point 089), of the hanging fern gardens. These two photo points (Photo points No. 9a, and 9b, as shown on the attached photos) depict the hanging fern growing out of the moist cracks in the rock structure.

A second riparian area photo point was established in the East Fork of the East Fork of Box Canyon adjacent to SUFCO water monitoring station 105 (see Photo 10w & 10t, as shown on the attached photos). The vegetation at this photo point consists primarily of sedges (*Carex spp.*), Willows (*Salix spp.*), Kentucky Bluegrass (*Poa pratensis*) and Englemann Spruce (*Picea engelmannii*) around the edges, scattered wire grass (*Juncus spp.*) and Quaking aspen (*Populus tremuloides*), and some Woods Rose (*Rosa woodsii*).

These photo points should be revisited again each year until the area has been subsided. The sites should be visited at approximately the same time of year so as to duplicate growth and maturity conditions.



Canyon Fuel Company, LLC
SUFCO Mine

VEGETATION PHOTO MONITORING LOCATIONS

DATE: JULY 18, 2000	SCALE: 1" = 1200'
397 SOUTH 800 WEST SALINA, UTAH 84654	DRAWN BY: BDH

FILENAME:

H:\DRAWINGS\MRP\PLATES\LINK-TRAIL.DWG

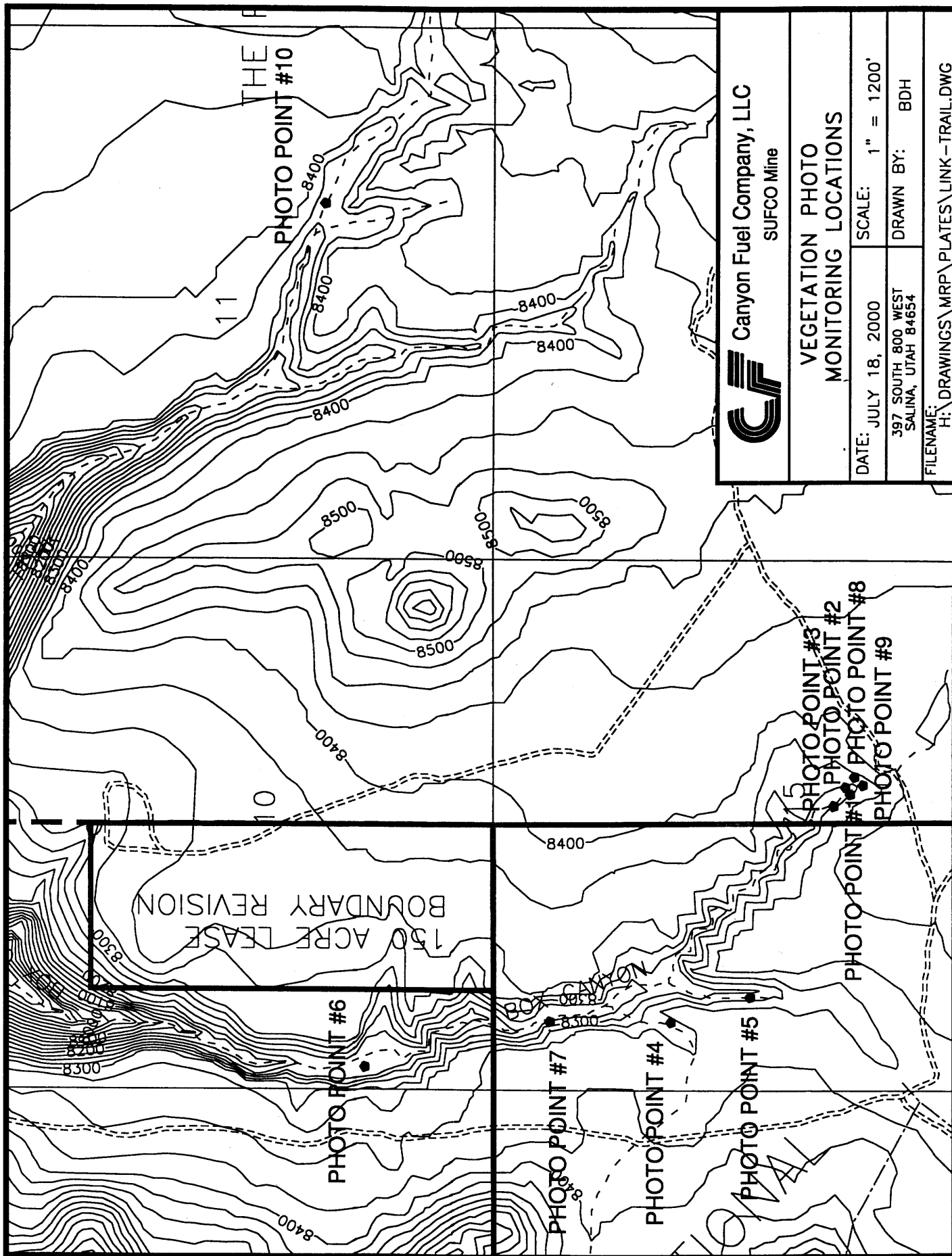




Photo Point #1a



Photo Point #1b

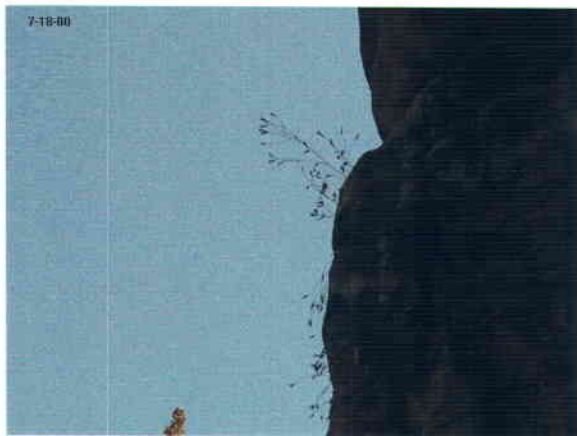


Photo Point #1c



Photo Point #2



Photo Point #3



Photo Point #4



Photo Point #5w



Photo Point #5t



Photo Point #6w



Photo Point #6t



Photo Point #7



Photo Point #8



Photo Point #9a



Photo Point #9b



Photo Point #10w



Photo Point #10t

- CONFIDENTIAL INFORMATION -

2000 Raptor Survey report has been removed from the Annual Report and is located in the Canyon Fuel Company, LLC – Sufco Mine Confidential MRP Binder located at:

Division of Oil, Gas & Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

INCORPORATED

AUG 09 2005

DIV OF OIL GAS & MINING

APPENDIX C

Legal Financial, Compliance and Related Information

Annual Report of Officers
As submitted to the Utah Department of Commerce

Other change in ownership and control information
As required under R645-301-110

CONTENTS

Data sheet report of directors and officers.

Canyon Fuel Company, LLC

Status: Active
Formation: Delaware

Federal ID #: 87-0567183

Primary Address

CityPlace One
Suite 300
St. Louis, MO 63141

Registered Address

The Corporation Trust Company
Corporation Trust Center
1209 Orange Street
Wilmington, DE

DIRECTORS

Yuzo Hirono
Steven F. Leer
Robert W. Shanks (Chairman)
Masayoshi Araya

Title
Director
Director
Director
Director

OFFICERS

Richard D. Pick
John W. Eaves
James E. Florczak
Robert G. Jones
William H. Rose
Janet L. Horgan

Title
President, Chief Executive Officer and General Manager
Vice President - Marketing
Vice President - Finance
Vice President, General Counsel and Assistant Secretary
Assistant Secretary
Secretary

INCORPORATION/QUALIFICATIONS

Jurisdiction	Inc/Qual
Delaware	Formation

Tax ID No.**Duration**

Arch Coal, Inc.

Status: Active
 Incorporation: Delaware
 Entity Type: Corporation
 Federal ID #: 43-0921172

Primary Address

CityPlace One
 Suite 300
 St. Louis, MO 63141-7056

Registered Address

The Corporation Trust Company
 Corporation Trust Center
 1209 Orange Street
 Wilmington, DE 19801

Former Name (s)

Arch Mineral Corporation

From Date

June 20, 1969

Through Date

June 30, 1997

Comment: Changed name to Arch Coal, Inc. upon merger with Ashland Coal, Inc.

DIRECTORS

	Title
Philip W. Block	Director
James R. Boyd	Director
Theodore D. Sands	Director
Thomas L. Feazell	Director
Robert L. Hintz	Director
Douglas H. Hunt	Director
Steven F. Leer	Director
James L. Parker	Director
A. Michael Perry	Director
Ignacio Dominguez Urquijo	Director

OFFICERS

	Title
James R. Boyd	Chairman of the Board
Steven F. Leer	President & Chief Executive Officer
Kenneth G. Woodring	Executive Vice President - Mining Operations
John W. Eaves	Senior Vice President - Marketing
C. Henry Besten, Jr.	Vice President - Strategic Marketing
Robert W. Shanks	Vice President - Operations
David B. Peugh	Vice President - Business Development
Terry O'Connor	Vice President - External Affairs
Larry R. Brown	Vice President & Chief Information Officer
William H. Rose	Vice President - Tax Planning
Bradley M. Allbritten	Vice President - Human Resources
Robert G. Jones	Vice President - Law, General Counsel and Assistant Secretary
James E. Florczak	Treasurer

John W. Lorson
Rosemary L. Klein
Charles David Steele

Controller
Secretary
Internal Auditor

DIRECT SUBSIDIARIES

Arch Australia Pty Limited
Arch Energy Resources, Inc.
Arch Reclamation Services, Inc.
Arch Western Acquisition Corporation
Ark Land Company
Allegheny Land Company
Apogee Coal Company
Arch Coal International, Ltd.
Arch Coal Sales Company, Inc.
Arch Coal Terminal, Inc.
Ashland Terminal, Inc.
Catenary Coal Holdings, Inc.
Coal-Mac, Inc.
Energy Development Co.
Mingo Logan Coal Company
Mountain Gem Land, Inc.
Mountain Mining, Inc.
Mountaineer Land Company
P. C. Holding, Inc.
Paint Creek Terminals, Inc.

Incorp/Formed in

New South Wales, Australia
Delaware
Delaware
Delaware
Delaware
Delaware
Delaware
Barbados
Delaware
Delaware
Delaware
Delaware
Delaware
Kentucky
Iowa
Delaware
West Virginia
Delaware
Delaware
Delaware
Delaware

INCORPORATION/QUALIFICATIONS

Jurisdiction	Inc/Qual
Delaware	Incorporation
Alabama	Qualification
Colorado	Qualification
Illinois	Qualification
Kentucky	Qualification
Missouri	Qualification
Montana	Qualification
New Mexico	Qualification
Virginia	Qualification
West Virginia	Qualification
Wyoming	Qualification

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

Mining Progress Map 2000

APPENDIX E

Other Information

In accordance with the requirements of R645-301 and R645-302

CONTENTS

None